**Gallego Elizabeth**

**Long-term Sustainable Development objectives:**

Human/environment interactions—Learners understand that human caused changes have consequences for the immediate environment as well as for other places and future times. World oceans are heavily affected by human activities, including pollution, depleted fisheries, and loss of coastal habitats. Learners are familiar with a range of environmental issues at scales that range from local to national to global. They understand that people in other places around the world experience environmental issues similar to the ones they are concerned about locally. **Young minds will learn information and awareness for sustainable development and lifestyles in harmony with nature.**

**Grade 8: Unit 4: Human and the Environment: Needs and Tradeoffs**

**Standards:**

LE. Key Idea 7: Human decisions and activities have had a profound impact on the physical and living environment.

Since the Industrial Revolution, human activities have resulted in major pollution of air, water, and soil. Pollution has cumulative ecological effects such as acid rain, global warming, or ozone depletion. The survival of living things on our planet depends on the conservation and protection of Earth’s resources. (7.2d)

RST.6–8.1: Cite specific textual evidence to support analysis of science and technical texts.

RST.6–8.2: Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

**Materials**:

* Maps from *Great Pacific Garbage Patch: A Plastic Vortex* retrieved from <http://esseacourses.strategies.org/module.php?module_id=189>
* Illustration of *U.S. Household Garbage (Municipal Solid Waste)* from *The Story of Stuff* by Annie Leonard
* Video: Movie Trailer for movie *Albatross* (2017) from <http://www.albatrossthefilm.com/trailer.html>
* Questions adapted from lesson *Teach Engineering: The Great Pacific Garbage Patch* <https://www.teachengineering.org/lessons/view/uoh_dig_mapping_less3>
* Article: *An Ocean of Plastic* (Science World Scholastic Magazine, April 2017) by Jennifer Barone retrieved from <https://scienceworld.scholastic.com/issues/2016-17/041717/an-ocean-of-plastic.html>
* Click [here](https://docs.google.com/document/d/10VWgf7HiQ6yWkT4LfDCyT7T2rgpAfSvt6clHpcgmVOE/edit?usp=sharing) for Short Response Rubric

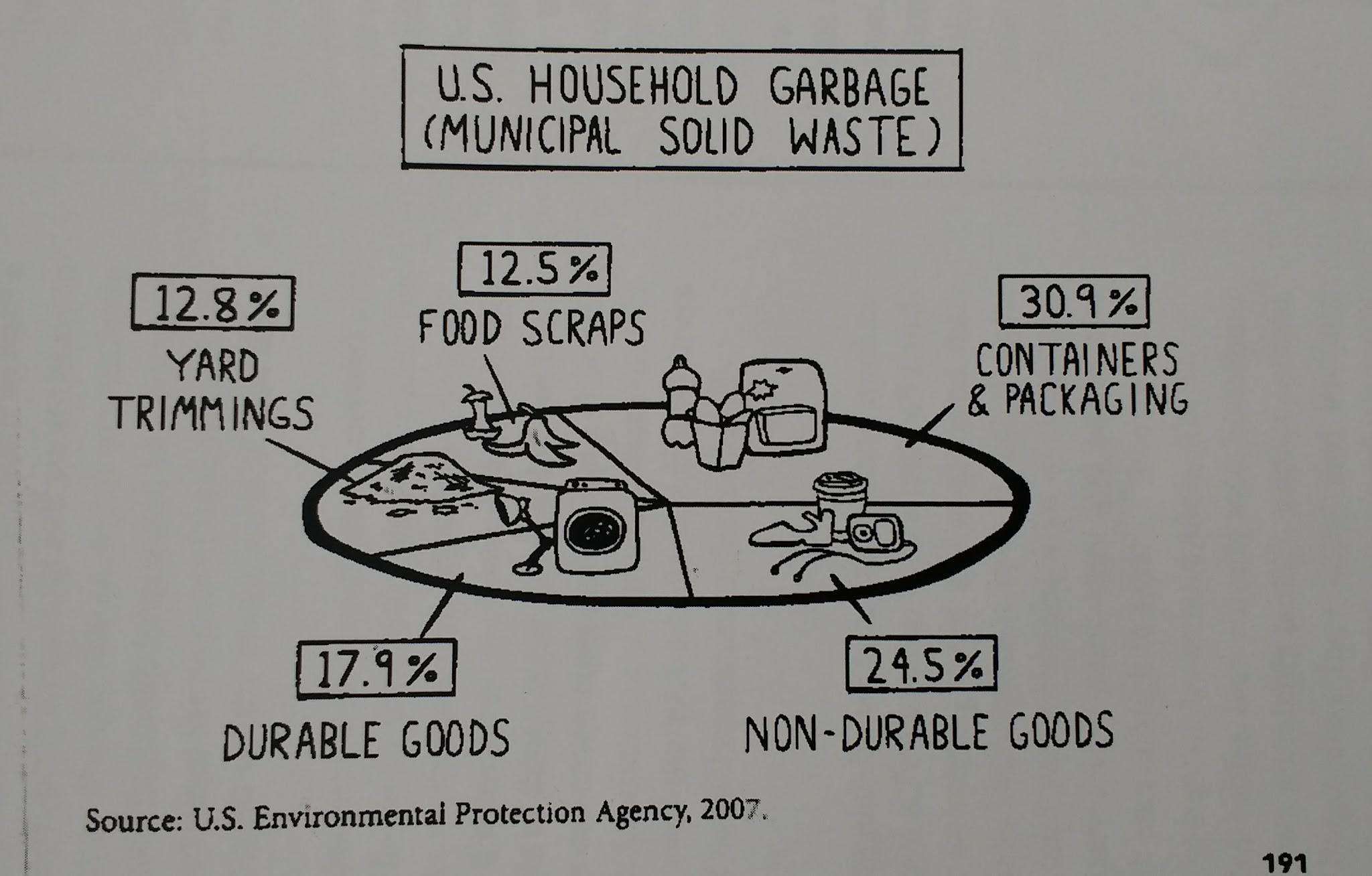
**Essential Question**: How does human consumption of resources affect the environment and our health?

**Objectives:**

* Explain in a general sense the Great Pacific Garbage Patch (GPGP).
* Describe how the GPGP is formed.
* Describe how the consumption of goods can result in environmental degradation.
* Explain why it is that some plastics are so resistant to degradation in the ocean.
* Name two or three major environmental impacts of the GPGP
* Brainstorm solutions to solve related problems

Procedure

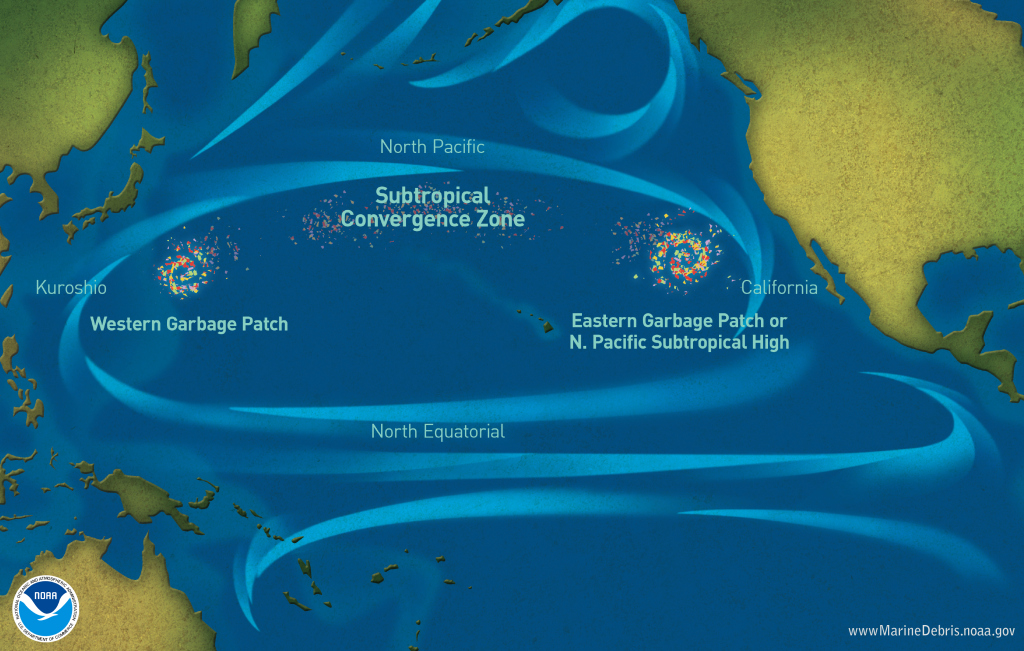
1. Present this illustration to students. Have them answer the question: **What is that trash mostly made of?**



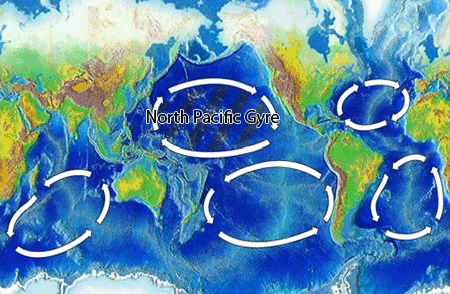
2. Have students watch the movie trailer, *Albatross (2017)* <http://www.albatrossthefilm.com/trailer.html> and **write a short response** based on the question: **What message is conveyed to viewers?** Have students share their thoughts.

3. **Making Connections-Relationship between human consumption of plastic and impact it has on marine life/environment**

Present this map:



And this map



Along with this excerpt from <https://oceanservice.noaa.gov/education/kits/currents/05currents3.html> retrieved from *National Oceanic and Atmospheric Adminstration* website

**Winds Drive Surface Ocean Currents**

Global winds drag on the water’s surface, causing it to move and build up in the direction that the wind is blowing. And just as the Coriolis effect deflects winds to the right in the Northern Hemisphere and to the left in the Southern Hemisphere, it also results in the deflection of major surface ocean currents to the right in the Northern Hemisphere (in a clockwise spiral) and to the left in the Southern Hemisphere (in a counterclockwise spiral). These major spirals of ocean-circling currents are called “gyres” and occur north and south of the equator. They do not occur at the equator, where the Coriolis effect is not present (Ross, 1995).

In groups, have students answer these questions:

1. **Why is so much trash out in the middle of the ocean and thousands of miles from land?**
2. **How do plastics and trash get from your yard all the way to the mid-Pacific Ocean?**

Have students **write** their own **definition of what the Great Pacific Garbage Patch is** based on these maps and text.

*I think the Great Pacific Garbage Patch is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

(If students have difficulty understanding how garbage patches are created, this video may help: <https://oceantoday.noaa.gov/trashtalk_garbagepatch/welcome.html> What is the Great Pacific Garbage Patch? From *Ocean Today. Watch. Explore.Discover)*

4. Go to <https://scienceworld.scholastic.com/issues/2016-17/041717/an-ocean-of-plastic.html> **Read aloud article, *An Ocean of Plastic*** by Jennifer Barone from *Science World Scholastic*. Pause to ask the following questions:

1. How does human consumerism contribute to this?
2. Would the patch be smaller if we recycled more?
3. Why is it that the patch does not collect banana peels, but instead collects plastic?
4. What are some major problems with the GPGP? (How is it affecting marine life? Durability of plastic/degradation of plastic)
5. Can the GPGP be cleaned up? Support thinking using text evidence.

**Evaluation:** Short Response Essay to assess students’ comprehension of this environmental issue. Students’ responses, particularly to questions about the GPGP cause, reveal whether or not they are grasping the issue. Students will use their notes taken from group discussions to write an short essay on **How might plastic trash affect the ocean environment? Can it be cleaned up?**

**Short Response Rubric:** [**https://docs.google.com/document/d/10VWgf7HiQ6yWkT4LfDCyT7T2rgpAfSvt6clHpcgmVOE/edit?usp=sharing**](https://docs.google.com/document/d/10VWgf7HiQ6yWkT4LfDCyT7T2rgpAfSvt6clHpcgmVOE/edit?usp=sharing)

**Homework:** Students may continue to work on their short response at home using the rubric.